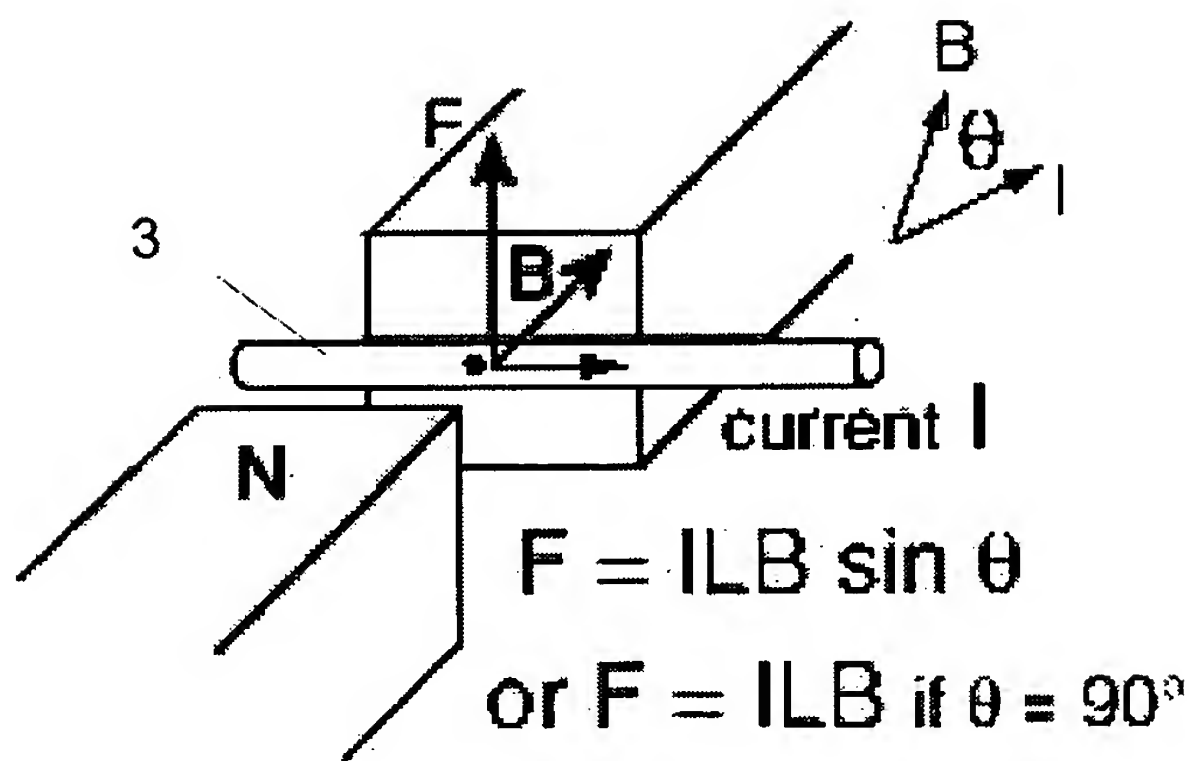$$mmf = N \cdot I$$

$$R_{mk} = \frac{L_{mk}}{\mu_{mk} \cdot A_{mk}}$$

$$R_{me} = \sum_k R_{mk}$$

$$\Phi = \frac{mmf}{R_{me}}$$

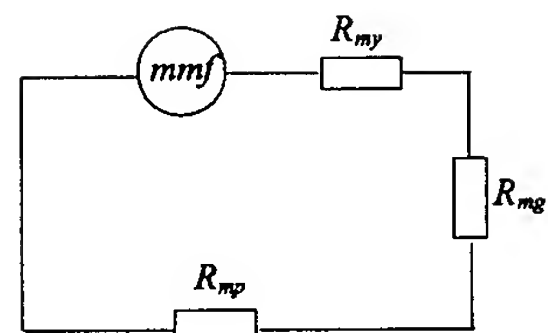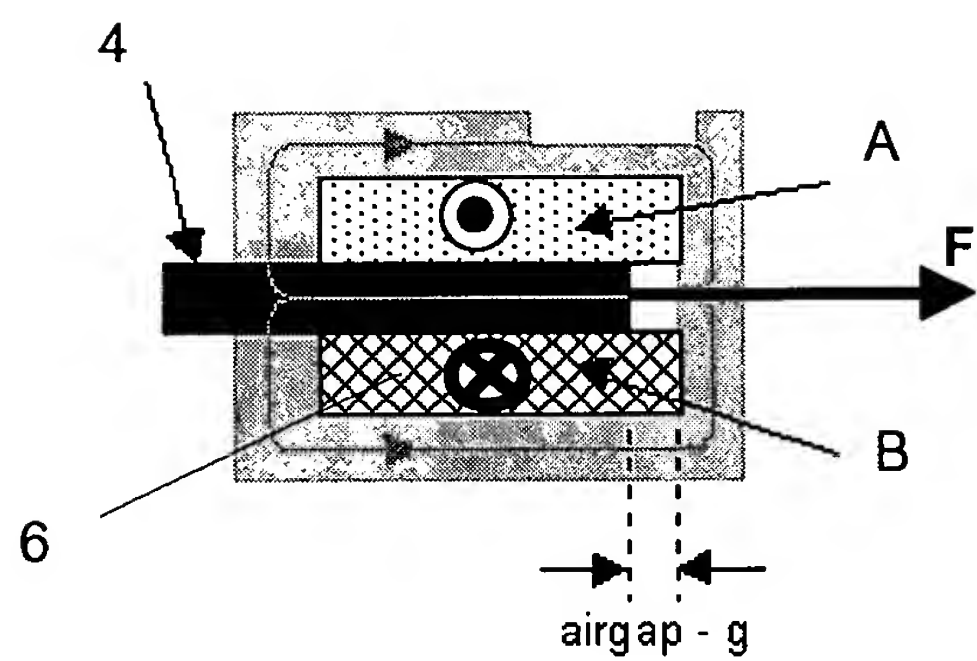$$F = \frac{\Phi^2}{2 \cdot \mu_0 \cdot A}$$

FIG. 1
(PRIOR ART)

$F = qvB \sin \theta$

$F = q\dfrac{L}{t} B \sin \theta$

$F = \dfrac{q}{t} LB \sin \theta$

$F = ILB \sin \theta$

$F = ILB \sin \theta$

or $F = ILB$ if $\theta = 90°$

current I

B

θ

I

F

B

N

3

FIG. 2
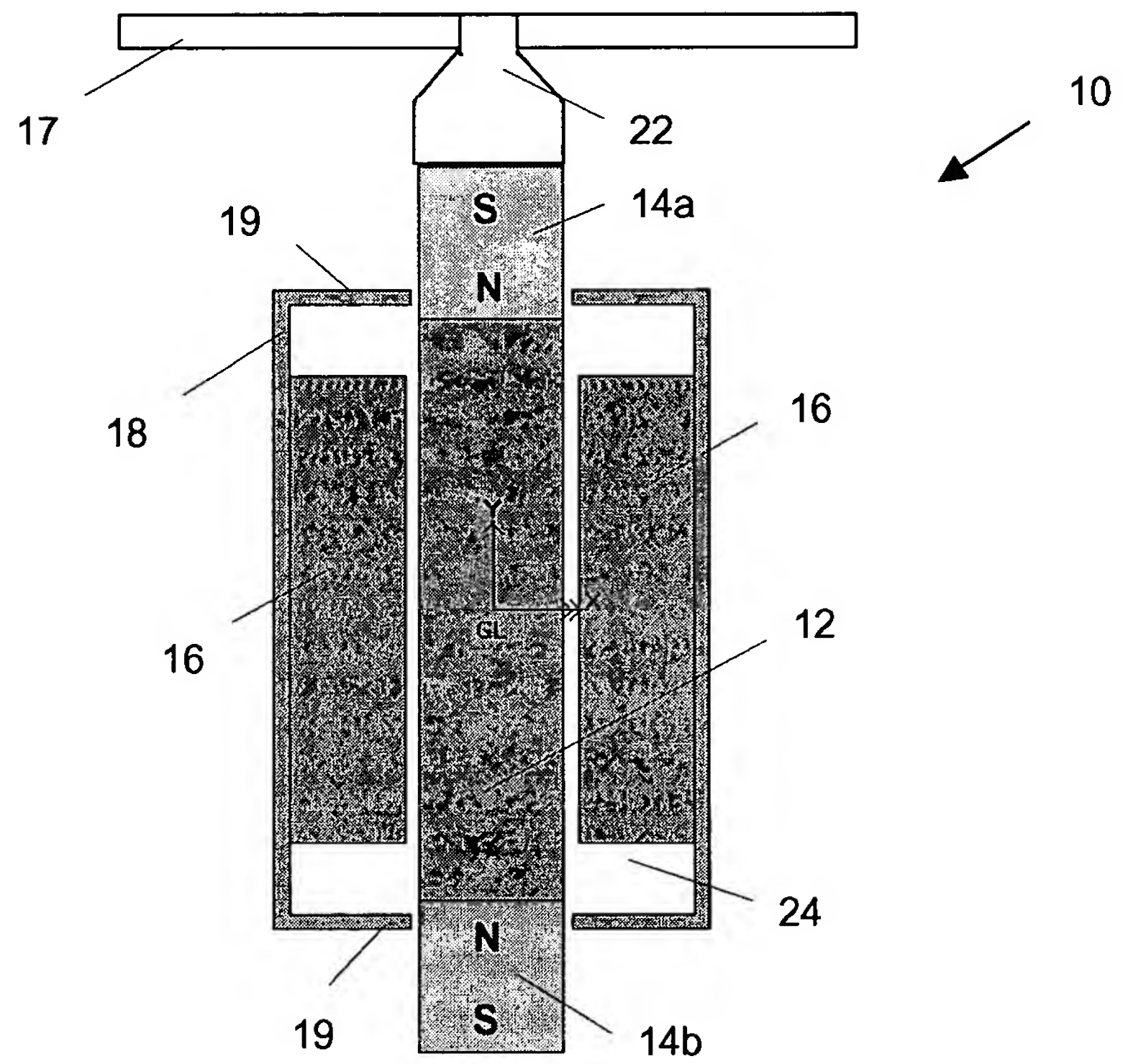**(PRIOR ART)**

$$mmf = N \cdot I$$

$$R_{mk} = \frac{L_{mk}}{\mu_{mk} \cdot A_{mk}}$$
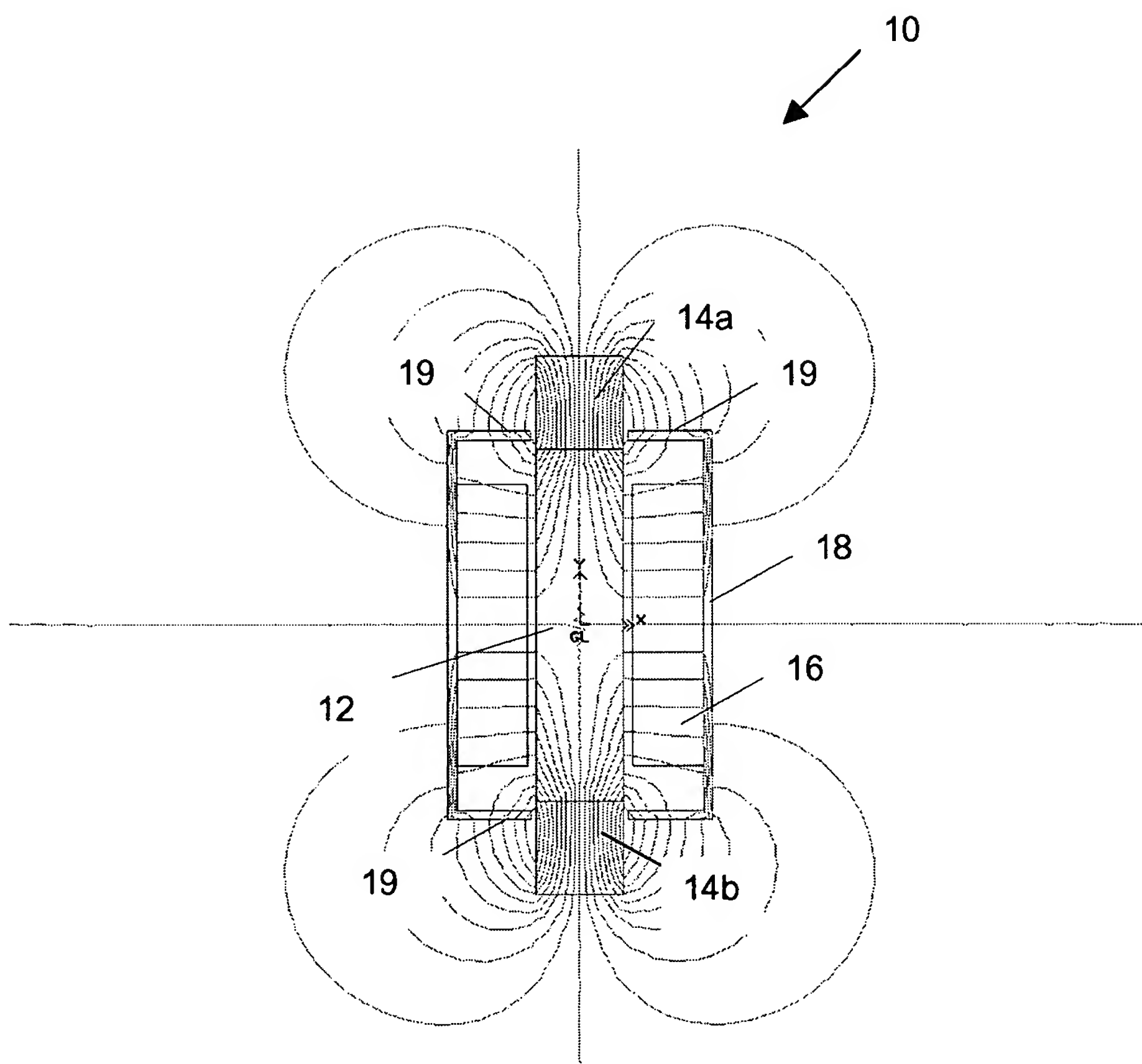
$$R_{me} = \sum_{k} R_{mk}$$

$$\Phi = \frac{mmf}{R_{me}}$$

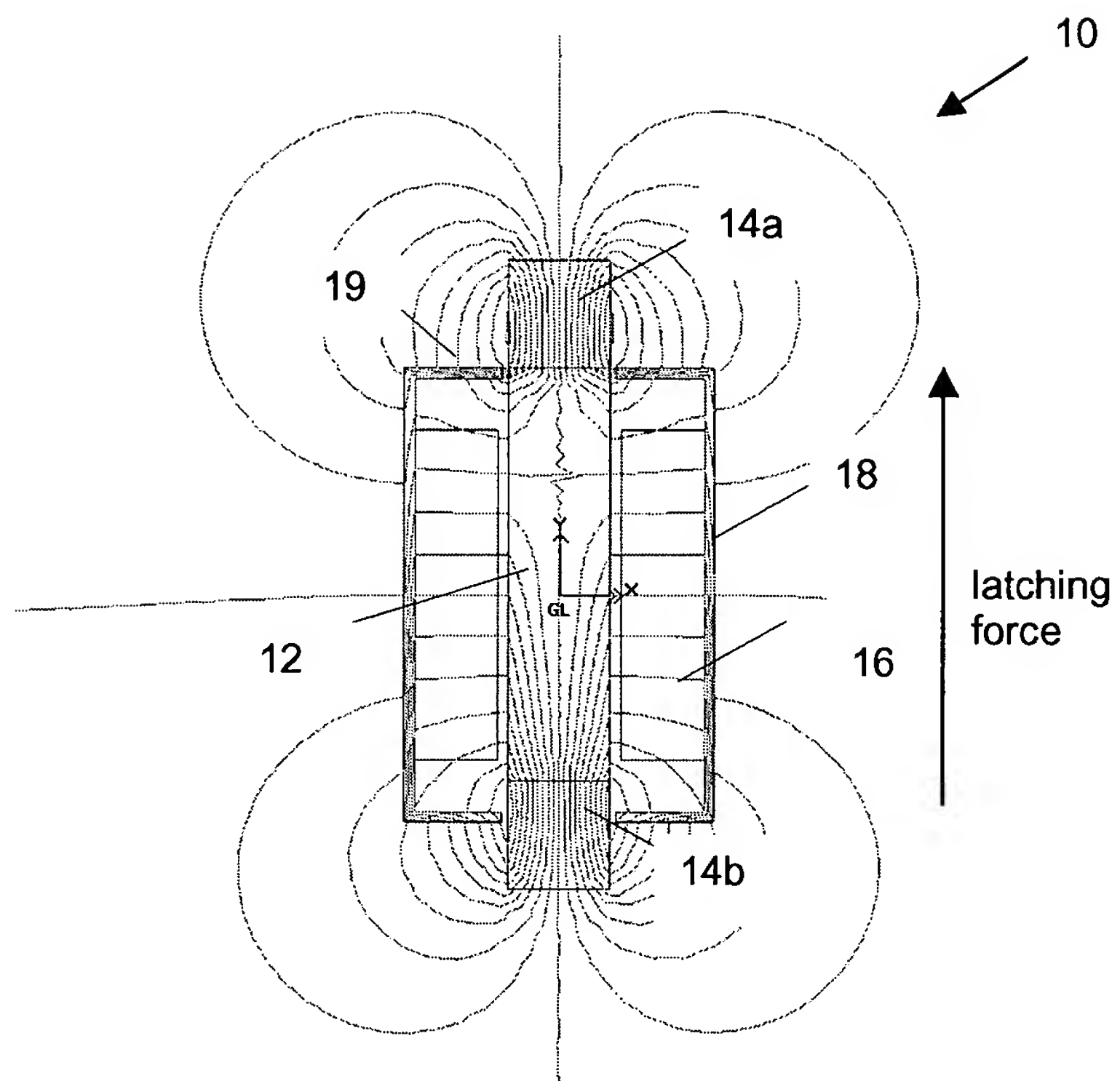$$F = -\frac{1}{2} \cdot \Phi^2 \cdot \frac{dR_{mg}}{dx}$$
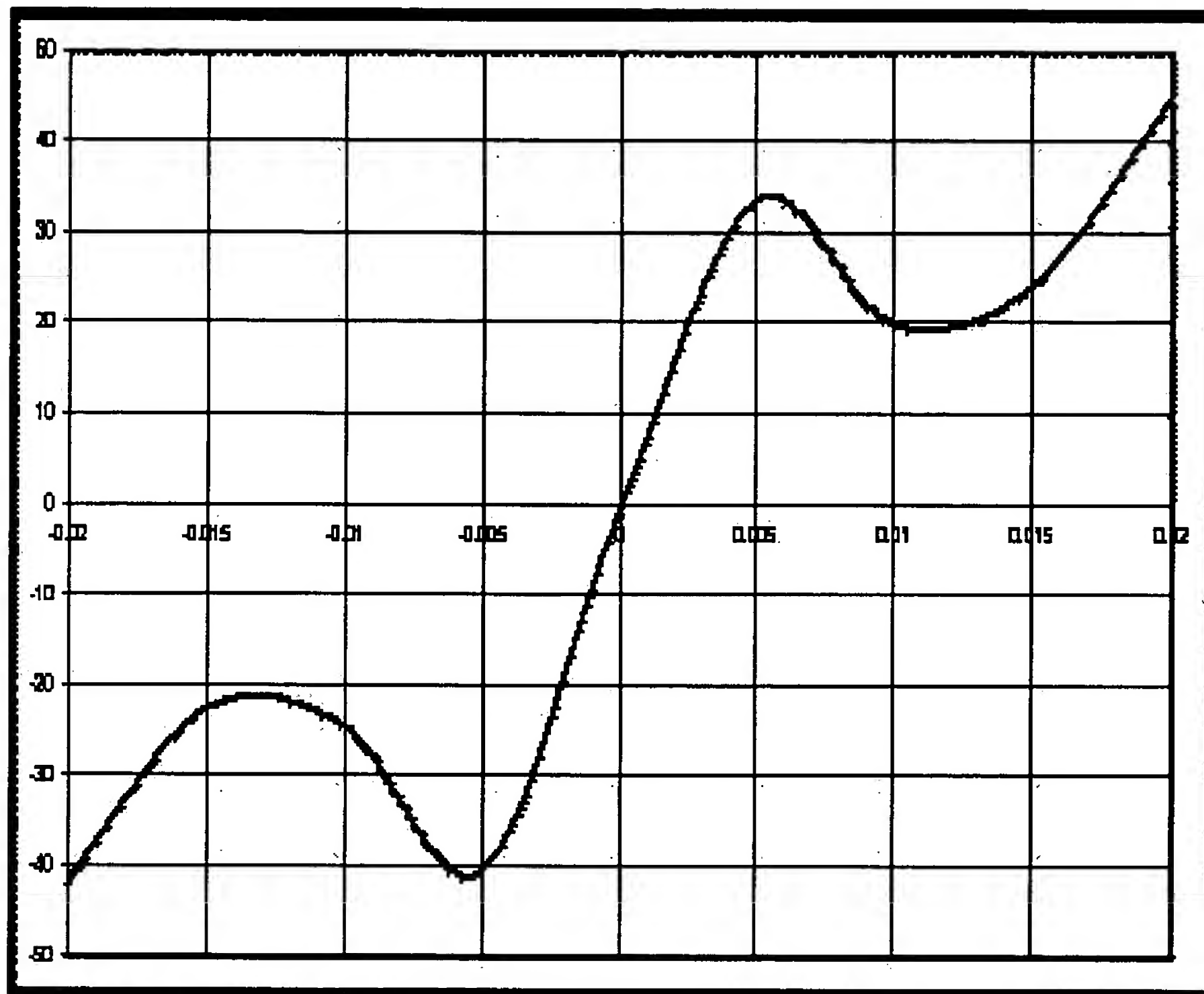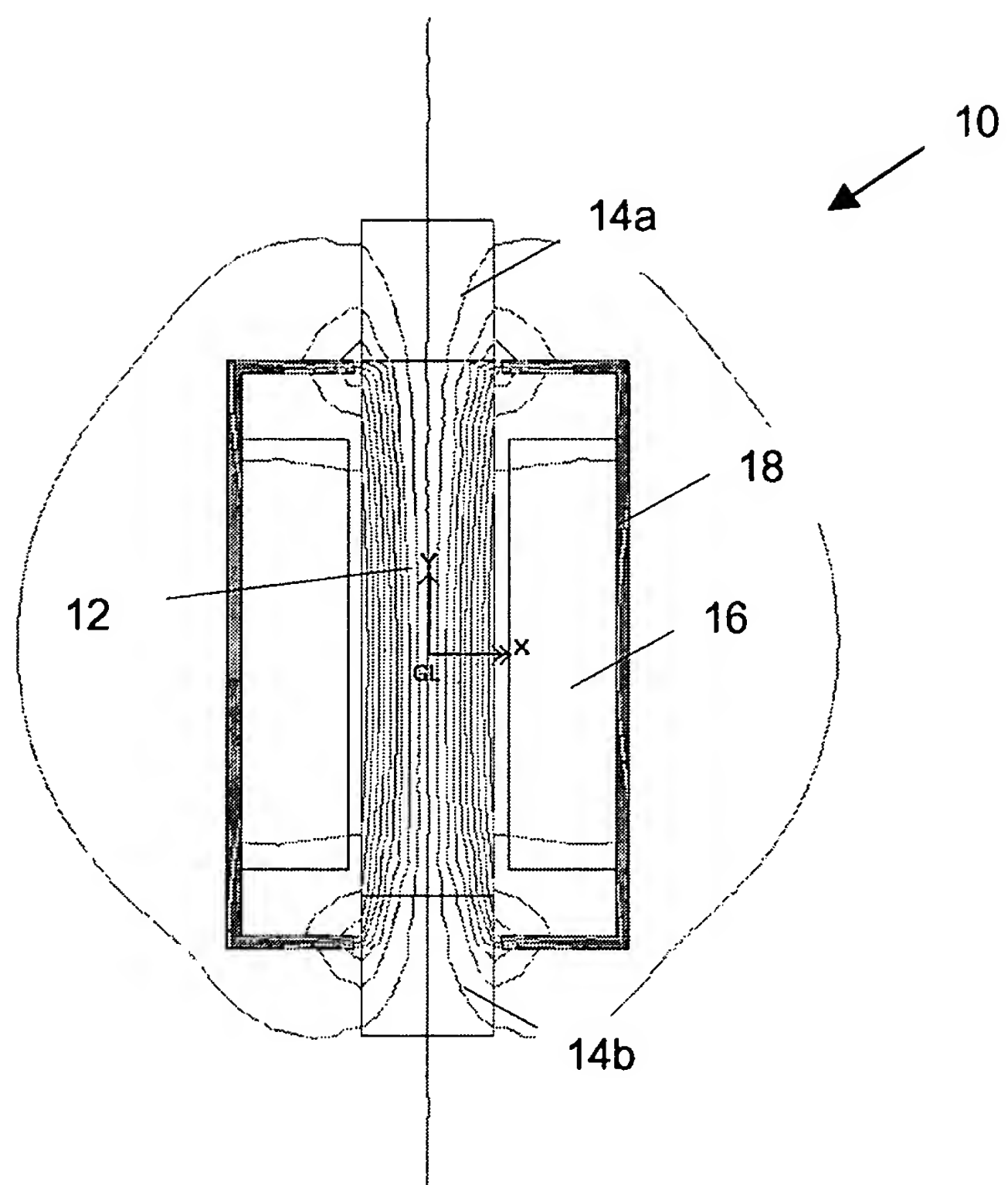
FIG. 3
(PRIOR ART)
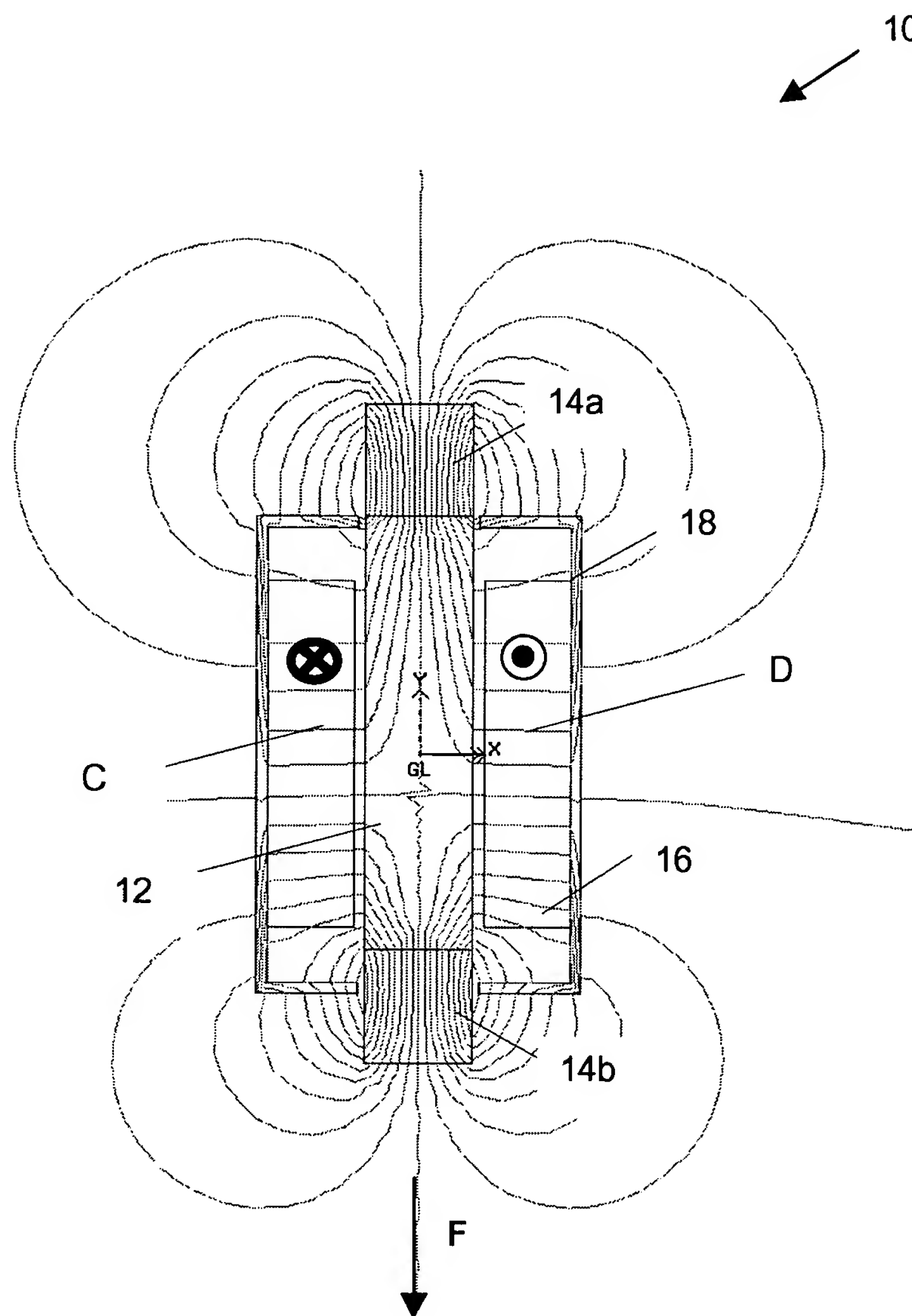
FIG. 4
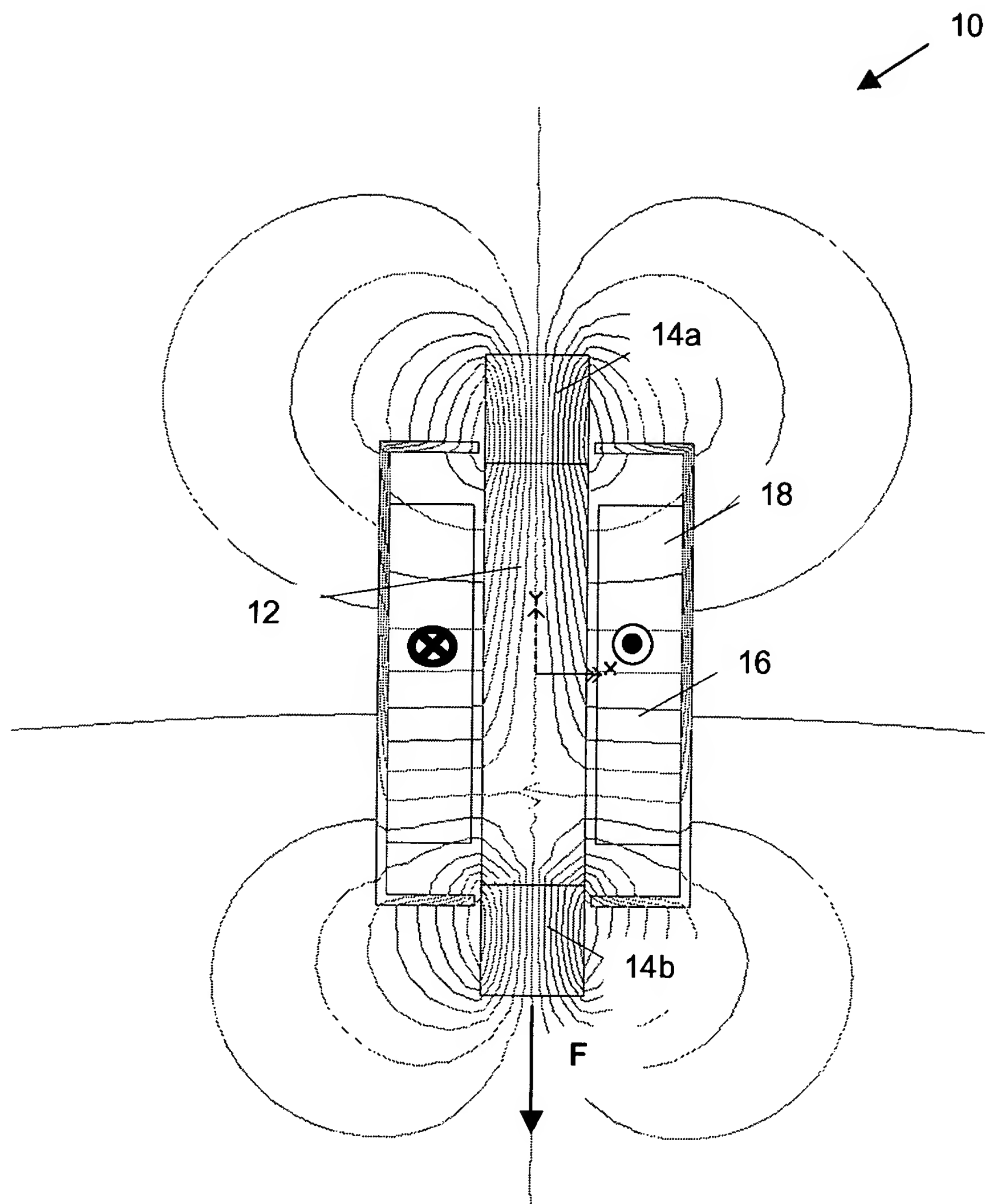
FIG. 5A

FIG. 5B

Latching force [grams]

Positional displacement [inches]

FIG. 5C

FIG. 6

FIG. 7A

FIG. 7B

10

14a

18

16

12

14b

F
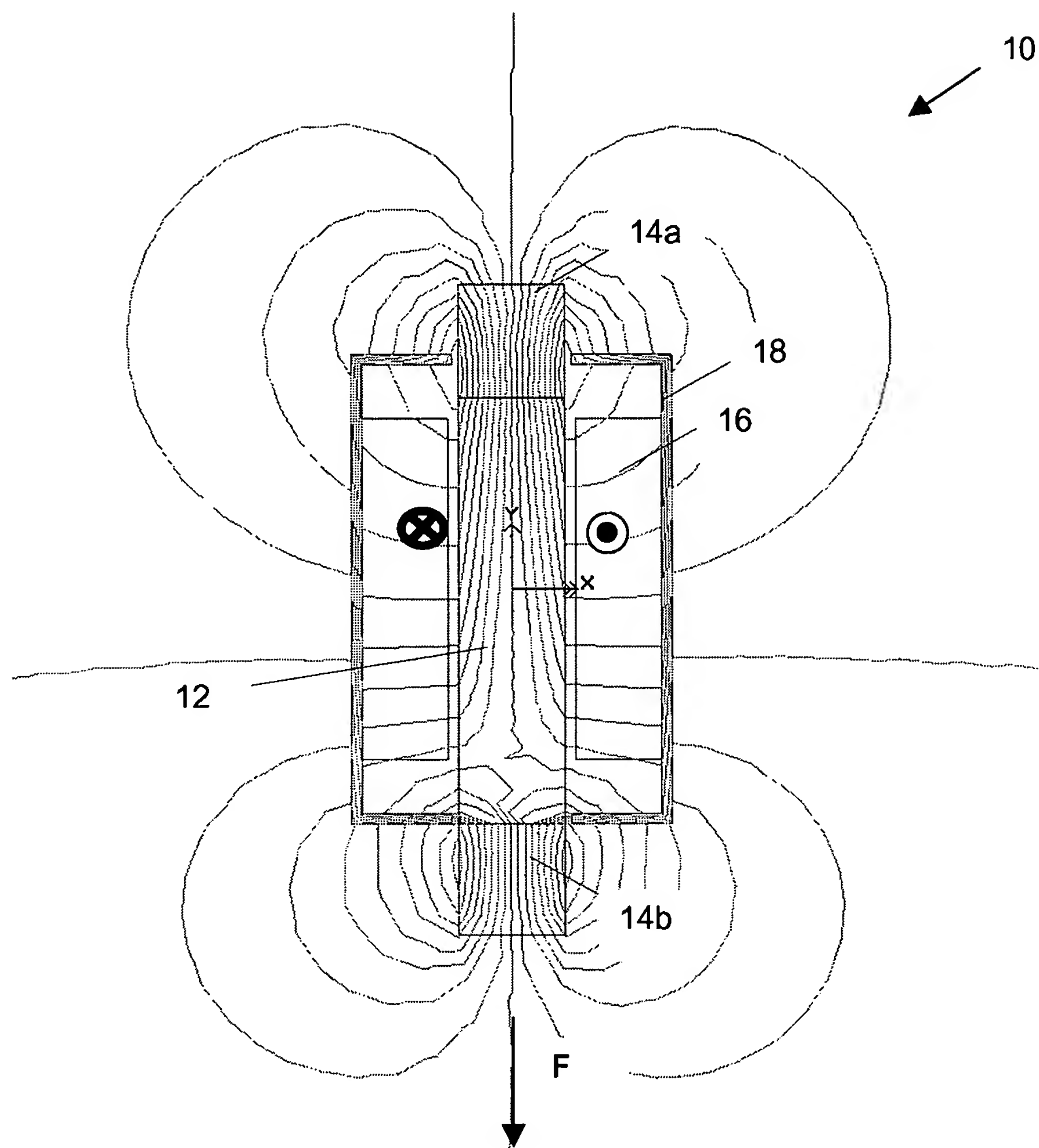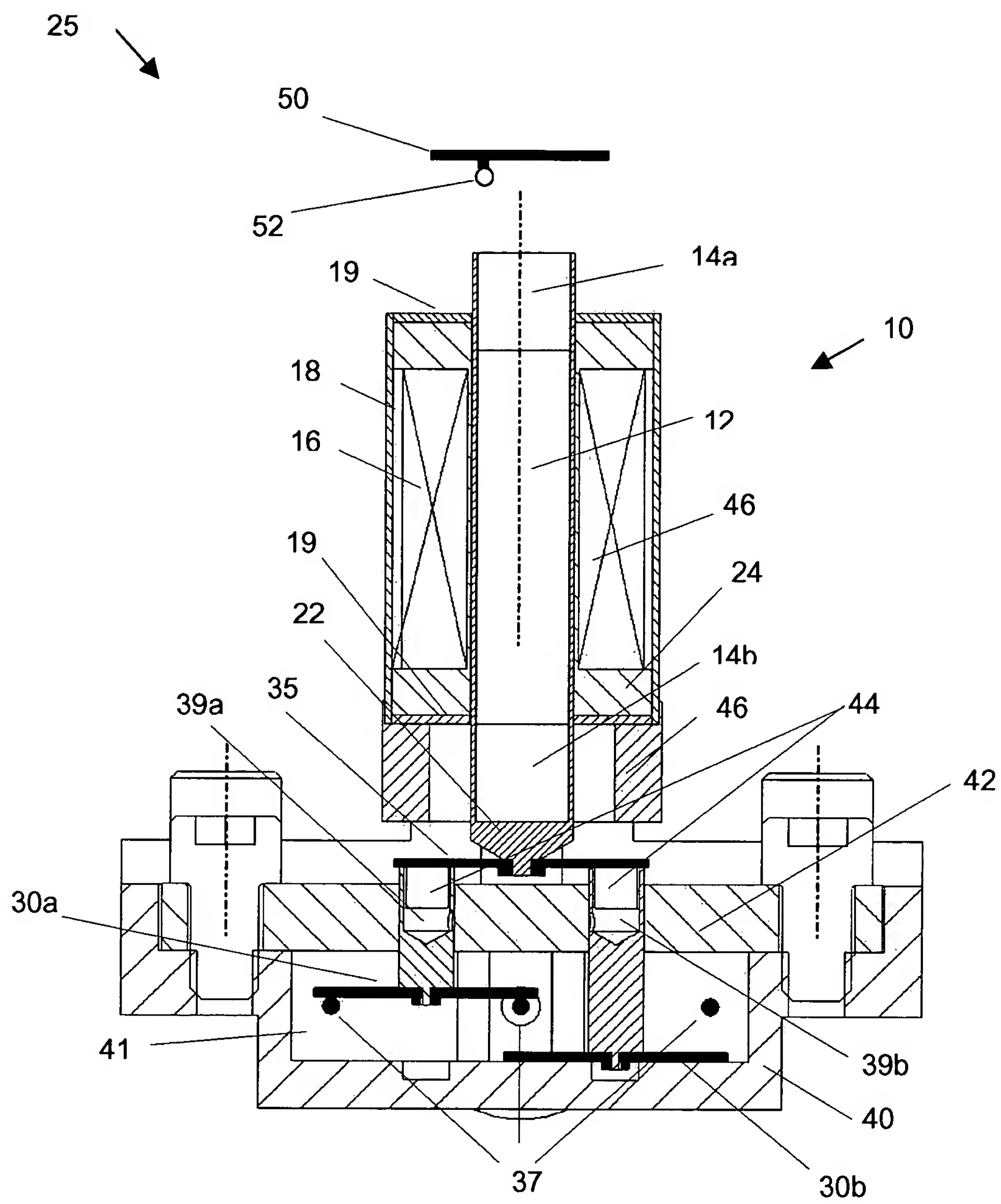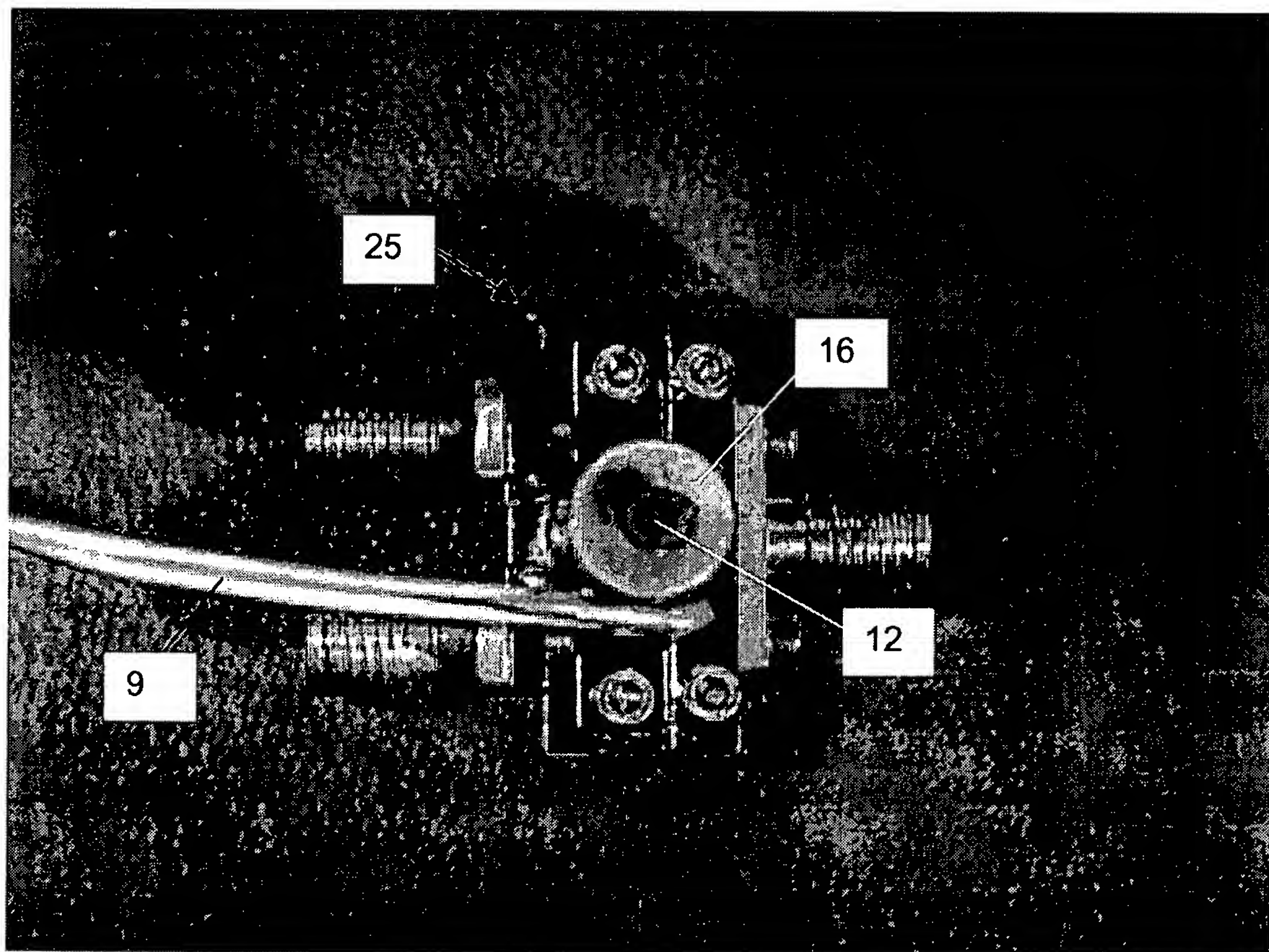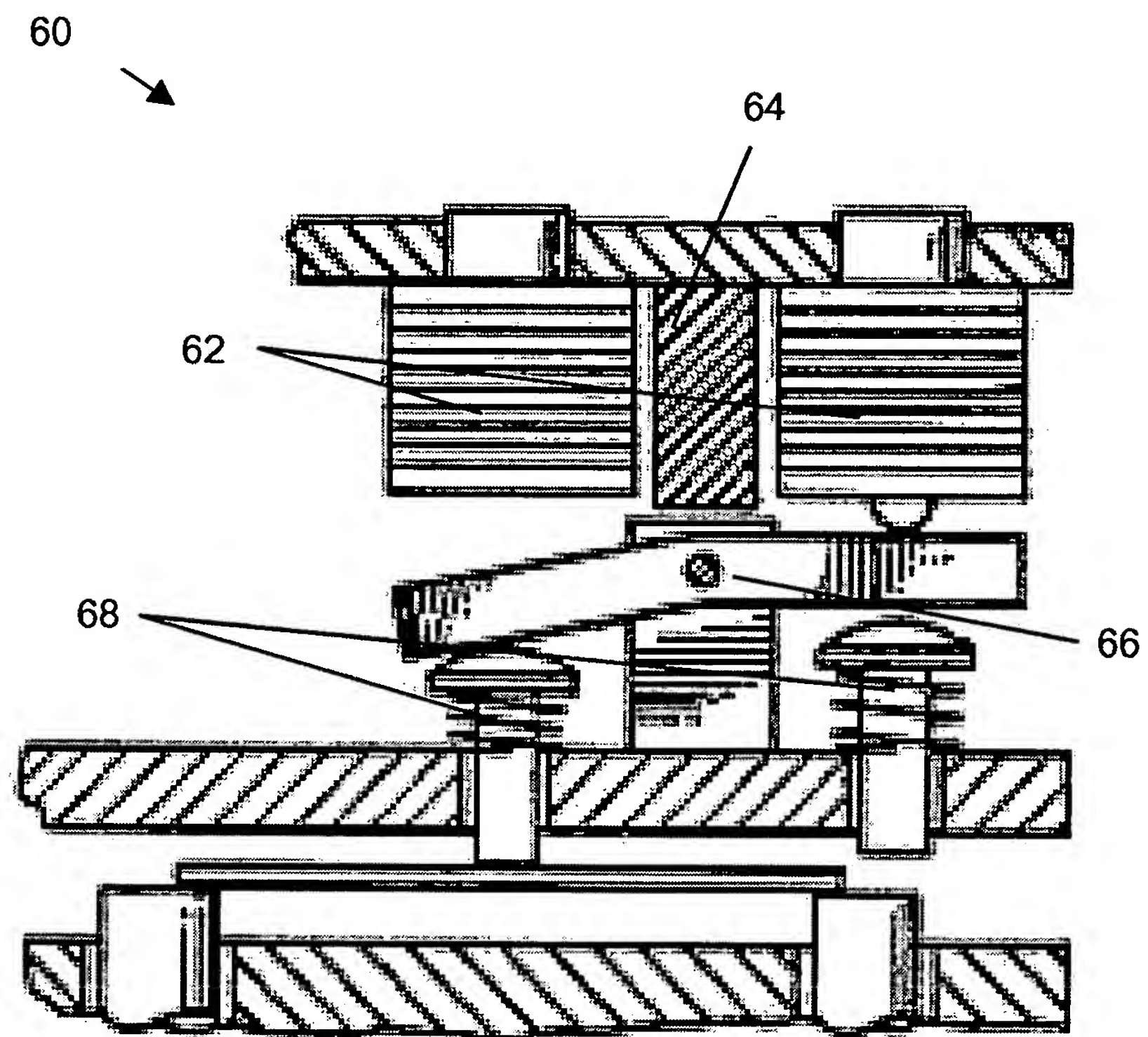
FIG. 7C

FIG. 8A

FIG. 8B

FIG. 9
(PRIOR ART)